



Governor's Action Team on Energy and Climate Change

State of Florida

DRAFT

Catalog of State Adaptation Actions

A catalog of state-level, vulnerability-reducing adaptation actions and policy options.

The framework for this catalog is based on a report entitled **Florida's Resilient Coasts: a state policy framework for adaptation to climate change**. The framework report suggests five principles to guide state policy development and adoption: a disciplined, comprehensive, purposeful, strategic, and efficient approach. In addition, this catalog drew from work done in Maryland, North Carolina, Washington, Queensland, Australia and the 4th IPCC report. Criteria for evaluating the draft policies listed below are to be determined by the Technical Working Group.

Citing the **Miami Dade Task Force Statement On Sea Level In The Coming Century**, scenarios for sea level rise (SLR) range as follows:

“Unfortunately, it looks as though sea level in the coming century will rise significantly more than two feet. With what is happening in the Arctic and Greenland, many respected scientists now see a likely sea level rise of at least 1.5 feet in the coming 50 years and a total of at least 3-5 feet by the end of the century, possibly significantly more (calculations used are provided at end of statement). Spring high tides would be at +6 to +8 feet. This does not take into account the possibility of a catastrophically rapid melt of land-bound ice from Greenland, and it makes no assumptions about Antarctica.”

When reviewing the draft catalog, please note that the text in black reflects the initial framework from the FAU Bollman report that the TWG used as a starting point. Text in blue reflects modifications and/or additions suggested during the TWG's second teleconference meeting. Text in green reflects other additions put forward for the TWG's consideration.

Option No.	Adaptation Policy Option	Criteria 1	Criteria 2	Criteria 3	Levels of Consensus	Notes / Related Actions in Florida
<p>Five principles to guide state policy development and adoption: a disciplined, comprehensive, purposeful, strategic, and efficient approach.</p>						
ADP-1	ADVANCING CLIMATE SCIENCE DATA AND ANALYSIS					
	Foster and support Florida climate science research agenda to assess short, medium and long term impacts including data collection and analysis of SLR, salt water intrusion, drought, more frequent and intense storms, storm surges, flooding, and tides , erosion, heat waves, and storm water runoff.					FAU framework: consider support for existing Florida Coastal Observing System to include climate impacts
	<p>Undertake specific analysis of uncertainties and contingencies in climate scenarios</p>					
	Build Decision Support Structure to Guide Ongoing Florida-specific research agenda					FAU framework: consider update of mission and goals of existing Florida Oceans and Resources Council (or new Climate Change Scientific Advisory Council to advise state government).
	Evaluate effectiveness of adaptation strategies at regular intervals					FAU framework: consider support for existing Florida Coastal Observing System to include climate impacts

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	Establish and Identify Long Term Funding to support research					FAU framework: Funding should be protected from short term economic or political cycles.
	Engage Public and Private Universities w/ private sector in Research Partnerships e.g. Centers of Excellence					Engaging public and private universities and the private sector
	Link Science to Public Education Effort					
	Develop and implement an environmental scorecard that would track ecosystem change.					
	Establish a state climate change data bank and network, with explicit and transparent protocols for access and use of the data					
	Establish new Climate Change Scientific Advisory Council to advise state					
	Institutionalize ready access to best available science from regional to site-specific scales, relating science to climate change impacts (on stream hydrology and aquatic resources). WA					
	Develop a clearinghouse for					

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	scientifically credible field-level best practices to address natural system responses to climate change. WA					
	Science and Engineering – needs further definition					Responds to FL ADP TWG comment. Needs further definition.
	Support ongoing collection and analysis of SLR, storm surge, and tidal data by existing institutions					Micro data is needed identifying direction and speed of storm surges.
	Create scientific advisory committees to assist decision-makers in responding to extreme forest health and fire hazard problems. (Wash)					
	Establish a series of permanent monitoring stations to measure the absolute changes in sea level rise in coastal FL and characterize the dynamics of estuarine storm surges, astronomical and wide tides and water flow. (NC)					
	Compile and evaluate existing research on the effects of a warmer climate on forest ecosystems and commercially grown tree species and potential impacts on the forest products					

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	and tree industries.					
	Integrated ecological monitoring to identify anthropogenic changes, including climate change, and predict fish productivity					
	Integrated monitoring systems in productive areas, aimed at obtaining systematic information on hydro-physical, hydro-chemical, and hydro-biological processes					
ADP-2	PLANNING AND DECISION MAKING					
2.1	Comprehensive Land Use Planning and Building Regulation: Incorporate climate change and its impacts into planning and decision-making processes.					Note relevance of state planning agency Dept of Community Affairs, regional planning councils and local governments. Suggested timeframe for adaptation planning is the year 2060.
	Review interior/non-coastal land use plans in anticipation of increased development pressures*					Addressing concern about coastal-centricity of framework and population relocation to interior communities.
	Review planning laws, maps, plans, and development guidelines for climate impacts such as SLR, salt water intrusion, drought, more frequent and intense storms, storm					

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	surges and flooding, erosion, heat waves.					
	Support/Conduct Regional Land Use Planning					
	Review 'Coastal High Hazard Areas' Law including FI Keys					
	Update Florida 'Assessment of Coastal Trends'					
	Explore Tax Policy as Tool					
	Add Climate Change to 'Taxation and Budget Reform Commission' Agenda					Short time line: May 4, 2008 deadline.
	Review State Building and Design Codes to promote resiliency of communities, to mitigate storm and flood damage.					
	Engage Regional Process including Caribbean Neighbors					
	Undertake specific analysis of uncertainties and contingencies in climate scenarios					
	Incorporate best available sea level rise and other climate change data and information into local government planning to promote resiliency of ecological systems and					

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	communities. (WA)					
	Increase erosion and hazard planning focused on sheltered coastlines					
	Flood plain mapping					
	Integrated coastal zone management (ICZM)					ICZM as “a dynamic, multidisciplinary and iterative process to promote sustainable management of coastal zones. It covers the full cycle of information collection, planning (in its broadest sense), decision making, management and monitoring of implementation. ICZM uses the informed participation and cooperation of all stakeholders to assess the societal goals in a given coastal area, and to take actions towards meeting these objectives. ICZM seeks, over the long-term, to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics. 'Integrated' in ICZM refers to the integration of objectives and also to the integration of the many instruments needed to meet these objectives. It means integration of all relevant policy areas, sectors, and levels of administration. It means integration of the terrestrial and marine components of the target territory, in both time and space.
	Coastal re-alignment planning e.g. under the Essex Wildlife Trust which converted over 84 ha of arable farmland into salt					

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	marsh and grassland to provide sustainable sea defenses; (IPCC)					
	Given SLR, assess potential loss of barrier islands, and property damage under a range of scenarios.					
	Establish a series of permanent monitoring stations to measure the absolute changes in sea level rise in coastal FL and characterize the dynamics of estuarine storm surges, astronomical and wide tides and water flow.(NC)					
	Inventory and map the estuarine and ocean shoreline and its bathymetry, sediments, and vegetation.					
	Develop rapid technology transfer mechanisms to facilitate the use of modeling information in plans and prioritization. (WA)					
	Land use planning to allow species and habitat migration					
	Engaging and coordinating scientists, policymakers, the media and the public in decision-making					

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	Engage business leaders to address challenges					
2.2	Water Supply and Delivery					
	Review 1972 Water Resources Act as driver legislation					
	Review 'State Water Plan', 'Surface Water Improvement and Management' plans, regional water supply plans, and the annual status report on water supply given climate change impacts					
	Establish Interregional Water Planning Among Five Districts					The Central Florida Coordination Area, which includes six counties and three districts, could be model.
	Establish water conservation, reclamation, recycling, and reuse goals and an accountability system to ensure goals are met.					
	Identify Methods and Incentives for Storm Water Collection and Re-use (by industry and households)					
	Establish Water & Climate Change Task Force					
	Assess implications of impacts					South Florida Ecosystem

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	for state-managed natural resources i.e. Everglades and others					Restoration Task Force could be tasked with this.
	Assess estimated changes in water supply and base water policies on these assessments (taking note that past is no longer indicator of future)					
	Incorporation of water stakeholders in decision making process					Research indicates that involving stakeholders in water allocation decisions is successful approach.
	Assess, monitor and create mitigation plans to address threat of salt water intrusion into water supply					May be redundant with Florida specific plans above.
2.3	Transportation and Other Infrastructure					
	Ensure Climate Change is considered as part of upcoming review of 'Florida's State Transportation Plan'					Probably goes to TLU
	Review of Department of Transportation's Future Corridors Initiative					Probably goes to TLU
	Require/Enable Metropolitan Planning Organizations to take climate into account					

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	Integrate Transportation and Land Use Planning					
	Review 'Waterfronts Florida' program for SLR & other climate impacts					
	Establish Climate Change and Public Infrastructure Task Force					
	Review Public Education Capital Outlay (PECO) Trust Fund funding criteria for climate risk					
	Engage Utility Siting Board in incorporating SLR and climate risk factors					
	Re-Evaluate Evacuation Routes					
	Evaluate and improve capacity of storm water infrastructure for high intensity rainfall events					
	Design of sewer and storm water systems to prevent fresh water contamination with an eye toward water re-use.					
	Increase capacity of water re-use infrastructure					
2.4	Conservation of Natural Lands and Marine Systems					
	Evaluate Land Acquisition for Adaptation Purposes, especially					Note: Expiring Florida Forever program should be extended or

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	in anticipation of SLR, increase in frequency of severe storms,					replaced with additional funds earmarked as lands may be an important buffer for human communities
	Integrate Statewide Conservation Priorities with Climate Impact Data					Note that Century Commission’s Critical Lands/Waters Identification project (CLIP), the Florida Natural Area Inventory, and the Cooperative Conservation Blueprint will be helpful in this regard.
	Re-Tool ‘Florida Keys Area of Critical State Concern’ Framework					Currently based on hurricane evacuation; needs to focus on climate risk. Consider special adaptation process.
	Conduct a “Florida Shoreline Impact Assessment Project,” to establish a baseline of data on the existing coastal resources and the projected impacts of sea level rise, and include tides, weather, and short-term (El Nino-type) components as well as long term in the scenarios.					
	Assess economic value of environmental services					
	Complete a vulnerability assessment to identify specific species, habitats, landscapes, ecosystem functions, and					

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	cultural resources that may be most sensitive to climate change.					
	Develop a better understanding of likely impacts on tree species, evaluate strategies and begin to implement risk management strategies to ensure perpetuation of tree genetic resources.					
	Identify and maintain protected forest areas that may be capable of sustaining at-risk species.					
	Organization of marine biosphere reserves and protected areas for the habitat of marine mammals					
	Use of emerging predictive information related to natural climate variability (e.g., ENSO) to support fishery management and planning.					
	Assess threat of increased wildfires					
	Improve and protect stream flows for environmental and resources values. (Wash)					
	Develop strategies to respond to					

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	potential increases in undesirable exotic and invasive species.					
	Develop guidelines to address climate impacts in habitat restoration and protection projects, and direct state and local governments to use them. (WA)					
	Protect and Restore Coastal landforms (coral reefs, barrier islands) and wetland ecosystems (mangroves, marshes) which provide a natural first line of protection from storm surges and flooding (IPCC)					
	Wetland Protection and Restoration (IPCC)					
	'Adaptive Corridors' concept					
	Reduce or eliminate ocean outfalls					
	Land use planning to allow species and habitat migration					
2.5	Beaches and Beach Management					
	Update Strategic Beach Management Plan with climate					

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	impacts					
	Explore alternative, cost-effective re-engineering strategies for navigation inlets to minimize beach impacts					
	Review State Beach Nourishment Program					
	Inventory and map the estuarine and ocean shoreline and its bathymetry, sediments, and vegetation.					
	Endangered Species Assessment					
	Assess full value of beach services including habitat, tourism, storm buffer, etc					
2.6	Extreme Events: Emergency Preparedness and Response					
	Include SLR data in hurricane preparedness, evacuation and recovery plans					
	Review the goals, strategies and plans of emergency preparedness, response and recovery data in light of heat waves, migrating disease vectors, SLF and storm surges.					
	Add climate change on official					

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	Florida Mitigation list.					
	Consider emergency preparedness to stock creeks with fish post-storm and flooding instances.					
	Heat Emergency Task Force to review emergency management planning requirements and guidelines for heat waves and emergency preparedness exercises.					
	Collaboration across multiple jurisdictions, landowners, and stakeholders is needed to promote agreement on forest health and fire hazard response approaches.					
	Appropriate statewide drought management strategies that account for evolving drought risks in a drier climate.					
	Fund accounts for drought preparedness and emergency water supply should be funded.					
ADP-3	INSURANCE					
3.1	Property insurance					
	Incentivize property owners to adopt climate protective					

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	practices					
3.2	Review Citizen's Insurance charter and performance accountability in the light of climate change predictions.					Citizens Property Insurance Corporation provides a public interest alternative to private wind insurance coverage (read: hurricane coverage)
	Require sellers of coastal properties to disclose potential hazards to buyers. The coastal hazards disclosure should accompany all real estate transfers of properties with oceanfront, sound or creek frontage in coastal counties.					
3.3	Casualty insurance					
ADP-4	STATE FUNDING AND FINANCING					
4.1	State Capital policies					
	Establish a consortium of state universities to undertake continuous economic analysis to develop the costs and benefits of coastal climate adaptation					FAU Bollman report proposes including Enterprise Florida and Centers of Excellence
	Establish a Climate Change Trust Fund with dedicated revenue sources and bonding authority					for the purpose of reducing future risk and the cost of future coastal climate impacts where a legitimate public interest is to be served.
	Explore potential of insurance					From the Bollman report.

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	industry to contribute to funding as beneficiaries of reduced risk					
	Explore potential of state pension funds investment					
	Cap and Trade Revenues					
	Private Philanthropy					
	Encourage private insurers, and Citizens Insurance, to invest in climate science as a 'present value of avoided future costs' strategy.					From the Bollman report.
	Establish a dedicated Florida Climate Preparedness Infrastructure Fund					To start saving funds for hard and soft infrastructure improvements
ADP-5	ECONOMIC DEVELOPMENT					
	Make Florida a world leader in the climate adaptation field: engineering and design services, climate-sensitive infrastructure systems, ecosystem and beach management, and other activities that coastal countries and regions around the world will need to master.					
	Initiate an economic development strategy focused					

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	on the goods and services that will be required to implement coastal climate adaptation					
	Market Florida's research agenda and products*					
	Pursue Emerging Green Sectors where FL has a comparative advantage i.e. solar					
	Education and job training programs to re-tool workforce to take advantage of green economy growth					
	Support Economic Remediation/Transition Programs for Most-Affected Industries					
	Identify methods and programs to adapt Florida's economy to More Frequent Tropical Storms, Sea Level Rise, Drought, Acute Flooding Events and salt water intrusion.					Example of drought resistant crops for the ag sector.
	Identify methods and programs to support adaptation of FL's Resource-based Industries to More Frequent Tropical Storms, Sea Level Rise, Drought, Acute Flooding Events, and Salt Water Intrusion					

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	Assess Potential Disruption to Florida's Major Economic Sectors Due to Climate Change (Tourism, International Trade and other sectors)					Move to Planning/Economic Dev.?
	Long and short term jobs analysis to identify which sectors/occupations will be positively/negatively impacted, with an eye towards job creation opportunities					Move to Planning/Economic Dev.?
	Encourage private insurers, as investors, and the state pension funds to consider climate impact prevention in the prudent investment of portfolios.					From Bollman report.
	Create incentives for private investment in creating 'climate safe' development					
ADP-6	HEALTH CONCERNS					
6.1	Assess Climate Impacts on Health, Human Welfare & Safety					This section is almost entirely drawn from Maryland.
6.2.1	Disease Prevention: Vector-borne diseases, Water-borne diseases					
	Augment vector surveillance and control programs for vector borne diseases that are likely to become more common or					

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	widespread with climate change					
	Vaccination campaigns					
	Stricter agricultural run-off control policies					
	Strengthen and enforce watershed contamination protection laws					
	Public education/prevention programs targeting most at-risk, vulnerable populations					
	Safeguard freshwater supply					
	Implement educational programs for schools and the public on how to help control vector breeding sites					
6.2.2	Acclimatization, resilience to thermal extremes					
	Require consideration of climate change projections in building guidelines and urban planning					
	Increase urban vegetation- plant trees, roof gardens, planned growth, etc.,					
6.2.3	Mitigate mortality and morbidity from extreme weather events					
	Planning laws that prevent new-construction in vulnerable zones					

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	Building design guidelines					
	Forced, subsidized migration					
	Economic incentives for building in non-risk zones					
	Establish communication mechanism to coordinate efforts between disaster relief and public health agencies.					
	Early warning systems for extreme weather coupled with adequate response plan					
	Implement educational programs on appropriate behavior and following extreme events					
	In the aftermath of extreme events, additional trauma occurs in terms of dispossession and mental health (IPCC)					
6.3	Work with insurance industry in design of enhanced programs					
6.4	Anticipate potential climate-driven immigration from neighboring countries					
6.5	Determine air quality strategies necessary to compensate for increased emissions associated with increasing temperatures.					

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ADP-7	SOCIAL EFFECTS OF CLIMATE CHANGE					
	Promote social and economic equity, reduce poverty, increase consumption efficiencies, decrease the discharges of wastes, environmental management, and increase the quality of life of vulnerable					Citing the IPCC, 'Policies that enhance social and economic equity, reduce poverty, increase consumption efficiencies, decrease the discharge of wastes, improve environmental management, and increase the quality of life of vulnerable and other marginal coastal groups can collectively advance sustainable development, and hence strengthen adaptive capacity and coping mechanisms.'
	Assess potential social impacts of climate change on incomes, and other measures of well-being in vulnerable communities					
	Design assistance programs to respond to potential economic, housing, etc dislocation					
	Establish "Climate Change Environmental and Economic Fairness Task Force" to ensure that no economic region or group bears a disproportionate share of the economic transition					
	Increased insurance costs					

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	Increased water costs					
	Equity is important factor in successful adaptation efforts (IPCC)					
	Impacts differ across socio-economic groups (e.g. Katrina) (IPCC)					
	Environmental justice					
	Assess Food Security					
ADP-8	ORGANIZING STATE GOVERNMENT FOR LONG-TERM ADAPTATION					
8.1	Establish an ongoing state-level decision making mechanism for climate adaptation					To be advised by new Climate Change Scientific Advisory Council
8.2	Establish a state climate change data bank and network, with explicit and transparent protocols for access and use of the data					
8.3	Make permanent Conversations on Climate Change to educate state policymakers					
8.4	Encourage all local governments to develop and adopt climate adaptation strategies					
8.5	Establish the role of "Climate Change Officer," in the state CFO function (like the role of					

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	Fire Marshal), to enable the office to review local government decisions that have climate aspects					
8.6	Build institutional capacity and knowledge to address impacts associated with climate change. (WA)					
8.7	Engage the private sector as a partner through market and investment opportunities.					
	Create programs and incentives to encourage the consolidation or cooperative management of natural resources (e.g., water, forests, fish and wildlife).					
	Prepare to transition from adaptation to 'sustainable development' over the long term					
	Improve coordination of regulatory requirements to remove unneeded barriers to preparation and adaptation.(WA)					
	Integrate carbon impact assessments of all major state expenditures from procurement, and state facilities, to state-funded infrastructure projects.					
ADP-9	COORDINATION WITH FEDERAL GOVERNMENT					

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	Partnering with states in ecosystem restoration projects					
	National Catastrophic Fund					
	Applied research and technical assistance					
	Coastal Zone Management program support					
	Coordination of public land management objectives with states to improve ecosystem resiliency					
	Seek federal funds for climate costs					
	Encourage a humane and compassionate national policy that addresses effectively the possibility of climate impact refugees, particularly from Florida's neighboring Caribbean island nations					
	Anticipate and pursue emerging national systems or agreements e.g. cap and trade system,					
	Monitor and take positions in Florida's interest on federal climate legislation in					
	Convey Florida's interests to the state's congressional delegation					

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ADP-10	PUBLIC EDUCATION AND OUTREACH					
	Education programs on climate adaptation					
	Create Adaptation Training Opportunities					The state government, universities, and private nonprofit conservation organizations should collaborate in the development of a comprehensive research and practitioner training program
	Outreach to the public and others to plan and prepare for climate change. (WA)					
	Create Adaptation Training Opportunities					The state government, universities, and private nonprofit conservation organizations should collaborate in the development of a comprehensive research and practitioner training program
	Engaging and coordinating scientists, policymakers, the media and the public in decision-making					Responsive to 'Critical Issues' concern #1 (FAU framework).
	Engage business leaders to address challenges					
	Develop a strategy for providing and communicating heat wave behavioral adaptations such as					

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	air conditioning availability and increased fluid intake.					
	Prepare public education materials to increase awareness of species disturbance and lost habitat. (WA)					
	Inform property purchasers and investors regarding risk of sea level rise that may affect coastal property. (WA)					
	Provide comprehensive data and information to landowners, policy-makers, and the public about existing and developing forest health and fire hazard conditions. (WA)					
	Provide educational outreach on water use and water conservation and efficiency.					
	Provide outreach to the public and others to plan and prepare for climate change. (WA)					
ADP-11	BUILT ENVIRONMENT, INFRASTRUCTURE AND COMMUNITY PROTECTION					
	Managed Retreat/Relocation					
	Limit infrastructure investments in hazard-affected coastal areas					

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	Site industrial systems away from areas vulnerable to changes in weather conditions					
	Update building codes, design standards to include setback zones and phased-out or no development in exposed areas					
	Consider relocation of threatened structures					
	Buyout of land in hazardous areas, upgrade building codes, state insurance pool, beach nourishment, and retreat from highest risk barrier islands and low-lying lands					Land
	Retreat from low-lying lands, prohibit or reduce hardening of estuarine shorelines, limit construction in 100-year floodplain, and significantly increase estuarine buffers and oceanfront setbacks.					
	Enact law that authorizes the state to secure a rolling property easement as sea level rises.					
	Based on survey vulnerable current inhabited areas, develop relocation plans and contingency measures in the					

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	event of emergencies. Be clear on economic support for covering relocation costs comes from.					
	Create incentives for individuals and businesses to reduce risk of losses due to climate through building design codes					
	Protection of Communities					
	Strengthen building codes and increase building inspection frequency					
	Update disclosure requirements for coastal hazards					
	Provide assistance or incentives for improving hazard preparedness of homes					
	Conduct a vulnerability assessment for cultural resources such as museums, historical sites					
	Review construction standards for piers and wharves for wave strength					
	Install hard structural options such as dikes, levees, floodwalls, saltwater intrusion barriers					

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	Soft structural options such as dune and wetland restoration and creation, tree and other plantings, and periodic beach nourishment					
	Create upland buffers					
	Minimization of paved surfaces and use of trees to reduce flooding					
	Require that local government coastal land use plans include a strategic plan for responding to sea level rise, and other climate risks.					
	Ensure adequate food security for emergencies and long term					
	Develop new criteria for 'climate safe' communities and developments					
	Accommodation					
	Hazard insurance for home owners and businesses					
	Evaluate and improve capacity of storm water infrastructure for high intensity rainfall events					
	Increase infrastructure design standards to address lower probability events (e.g. some					

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	cities are protecting to the 500 year event rather than the 100 year event because of the increased vulnerability)					
	Community education on hazards that addresses the relationship between climate variability and climate change					
	Surveillance and monitoring of sea-level rise connected to Storm-surge early warning system and adequate response, evacuation plan					
	Strict regulation of hazard zones					
ADP-12	PROTECTING RESOURCES AND RESOURCE-BASED INDUSTRIES					
	Adapting FL Industries to More Frequent Tropical Storms, Sea Level Rise, Drought, Acute Flooding Events, and Salt Water Intrusion					
12.1	Agricultural Industries					
	Assess climate impacts of SLR, severe storms and drought, salt water intrusion, invasive species and pests on FL's agriculture sector					
	Adapt agricultural industries to SLR, severe storms and drought, salt water intrusion,					

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	invasive species and pests					
	Ensure farmers, especially in remote, rural locations have access to most up-to-date weather forecasts					
	Target farmers in Early warning systems for extreme events					
	Change farming practices to conserve soil moisture and nutrients, reduce runoff and control soil erosion					
	Create mitigation plans in areas where water supply may become inadequate					
	Compile and evaluate existing research on the effects of a warmer climate on crop species to assess potential effects of a warmer climate on the agricultural industry.					Move to planning or AFW or research?
	Conduct research as needed to identify the potential effects of a warmer climate on the agricultural industry.					Move to planning or AFW or research?
	Identify alternate crops that respond well to hotter and/or dryer temperatures,					
	Consider growing conditions in					

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	controlled environments.					
	Sponsor gene manipulation work to adapt existing crops.					
	Assess potential new pest problems.					Move to planning or AFW or research?
	Research alternative methods for addressing new pests and management techniques.					
	Subdivide large fields, improve runoff channels in large fields					
	Modification of land use and agricultural practices including aquaculture, saline-resistant crops, depending on location and purpose					
	Ensure farmers, especially in remote, rural locations have access to most up-to-date weather forecasts					
	Early warning systems for extreme events					
	Develop policies concerning controversial resource maintenance issues for the NC coastal zone in the face of potential and direct Consequences of climate change.					

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	Conduct research to develop new crop varieties					
	Change farming practices to conserve soil moisture and nutrients, reduce runoff and control soil erosion					
12.2	Terrestrial Resources & Industry					
	Assess climate impacts of SLR, severe storms and drought, salt water intrusion, invasive species and pests on FL's agriculture sector					
	Adapt forest and forest products industries to SLR, severe storms and drought, salt water intrusion, invasive species and pests					
	Compile and evaluate existing research on the effects of a warmer and/or dryer climate on forest ecosystems and commercially grown tree species and potential impacts on the forest products and tree industries.					
	Conduct research as needed to identify the potential effects of a warmer and/or dryer climate on					

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	forest ecosystems and potential impacts on the forest products and tree industries.					
	Search for alternate economic ventures to replace the impacted industry or other trees that do well in hotter climates.					
	Sponsor gene manipulation work to adapt existing trees.					
	Subdivide large fields, improve runoff channels in large fields					
	Increase flood protection, e.g., levees, reservoirs					
	Wetland protection and restoration					
	Improve flood warning and dissemination					
	Curb floodplain development					
	Change land topography to reduce runoff, improve water uptake and reduce wind erosion					
	Assess potential new pest problems.					
	Research alternative methods for addressing new pests and management techniques.					
	Subdivide large fields, improve					

Option No.	Adaptation Policy Option	Criteria 1	Criteria 2	Criteria 3	Levels of Consensus	Notes / Related Actions in Florida
	runoff channels in large fields					
	Increase flood protection, e.g., levees, reservoirs					
	Wetland protection and restoration					
	Improve flood warning and dissemination					
	Curb floodplain development					
	Change land topography to reduce runoff, improve water uptake and reduce wind erosion					
	Assess impact of warmer climate on the types of tree species that can be grown economically.					
	Create incentives and programs to transfer knowledge and technologies to assist farmers with new production methods, drought tolerant species, etc. (WA)					
12.3	Marine Resources & Industries					
	Research and integrated management of fisheries within coastal and open marine ecosystems					

Option No.	Adaptation Policy Option	Criteria 1	Criteria 2	Criteria 3	Levels of Consensus	Notes / Related Actions in Florida
	Integrated ecological monitoring to identify anthropogenic changes, including climate change, and predict fish productivity					
	Modification and improvement of the technology of the fishing industry and management of the fish trade					
	Organization of marine biosphere reserves and protected areas for the habitat of marine mammals					
	Use of emerging predictive information related to natural climate variability (e.g., ENSO) to support fishery management and planning.					
	Tourism Industry					
	Develop policies concerning controversial economic and resource maintenance issues for the coastal zone in the face of potential and direct consequences of climate change.					
ADP-13	WATER SUPPLY AND DELIVERY					
	Adapting to More Frequent Tropical Storms, Sea Level					

Option No.	Adaptation Policy Option	Criteria 1	Criteria 2	Criteria 3	Levels of Consensus	Notes / Related Actions in Florida
	Rise, Drought, Acute Flooding Events, and Salt Water Intrusion					
	Identify and change existing water resource policies, agreements and laws that limit the ability to manage water resource problems caused by climate change. (Wash)					
	Evaluate options (reclaimed water, storage, water conservation and efficiency, desalinization) to meet water demand, considering climate change impacts . (Wash)					
	Pursue methods to protect water supply from salt water intrusion into drinking water supply					
	Pursue methods to ensure adequate water supply such as desalinization plants, use of new briny water for CO ₂ sequestration, injection of fresh water into aquifers and shifting industrial water uses to recycled water					
	Water reuse of wastewater from tertiary treatment plants, use of cisterns and rain barrels, water conservation techniques.					

Option No.	Adaptation Policy Option	Criteria 1	Criteria 2	Criteria 3	Levels of Consensus	Notes / Related Actions in Florida
	Continue to investigate and invest in the development of large and small scale water storage, including ground water storage (Wash)					
	Increase reservoir capacity					
	Surface Water					
	Ground Water					
	Floods and Droughts					
	Erosion and Sediment Transport					
	Removal of invasive non-native vegetation from riparian areas (IPCC)					
	Reduction in water demand for irrigation by changing the cropping calendar, crop mix, irrigation method, and area planted					
	Expanded use of water markets to reallocate water to highly valued uses					
	Tax credits for purchasing on-site water cisterns.					
	Promote alternatives to chemical use like ozone treatment					
	Increase water use efficiency and water recycling in industrial					

Option No.	Adaptation Policy Option	Criteria 1	Criteria 2	Criteria 3	Levels of Consensus	Notes / Related Actions in Florida
	and power station cooling					
	Improve management of underground water resources as population and demand grows					
	Increase standards to enhance resilience of natural water systems					
	Monitor groundwater salinity increase					
ADP-14	TRANSPORTATION AND OTHER INFRASTRUCTURE					
	Storm Water Infrastructure					
	Manage storm water onsite, utilize low-impact development techniques, or prohibit construction in the 100-year floodplain.					
	State law that requires development to capture and treat storm water onsite from the 10-year 24-hour storm.					
	Create a low-impact development unit within the Division of Water Quality to assist developers to design development projects that utilizes low-impact development techniques to protect water quality and prevent flooding and facilitate water re-use by					

Option No.	Adaptation Policy Option	Criteria 1	Criteria 2	Criteria 3	Levels of Consensus	Notes / Related Actions in Florida
	managing storm water onsite.					
	Incorporate future sea level rise concerns and other climate change impacts in prioritization for funding, design, and post-project operation and maintenance. (WA)					
	Better design for septic systems					
ADP-15	CONSERVATION OF NATURAL LANDS AND MARINE SYSTEMS					
	Implement 'Incremental Adaptive Management' (IAM)					IAM is a new resource management approach in case natural systems are so profoundly affected by sea level rise and storm surge that restoration to a status quo ante is not desirable.
	Coastal Resource Action Policies: Adapting to More Frequent Severe Storms, Sea Level Rise, Drought, Erosion, and Acute Flooding Events					
	Buyout of land in hazardous areas, upgrade building codes, state insurance pool, beach nourishment, and retreat from highest risk barrier islands and low-lying lands					

Option No.	Adaptation Policy Option	Criteria 1	Criteria 2	Criteria 3	Levels of Consensus	Notes / Related Actions in Florida
	Assess climate impact including SLR, Drought, etc on habitat for fisheries in early life stages, and terrestrial species					
	Assess loss of wetlands due to hardening of estuarine shoreline					
	Place the highest priority for permitting estuarine shoreline stabilization on techniques that protect fisheries habitat.					
	The General Assembly should create a Coastal Adaptation Program. Funds should be targeted for the purchase of conservation easements on low-lying coastal lands; for cost share incentive with land owners the construction of ecologically beneficial erosion control structures on estuarine shorelines; and for research to provide an assessment of the physical and ecological properties of the estuarine shoreline and the potential cumulative impacts (NC)					Integrated plan from North Carolina.
	Coastal reforestation					
ADP-16	BEACHES AND BEACH MANAGEMENT					

Option No.	Adaptation Policy Option	Criteria 1	Criteria 2	Criteria 3	Levels of Consensus	Notes / Related Actions in Florida
ADP-17	EXTREME EVENTS: EMERGENCY PREPAREDNESS AND RESPONSE					